

(No Model.)

2 Sheets—Sheet 1.

H. F. BECHMAN.

THROW-OFF MECHANISM FOR PRINTING PRESSES.

No. 346,635.

Patented Aug. 3, 1886.

Fig. 1.

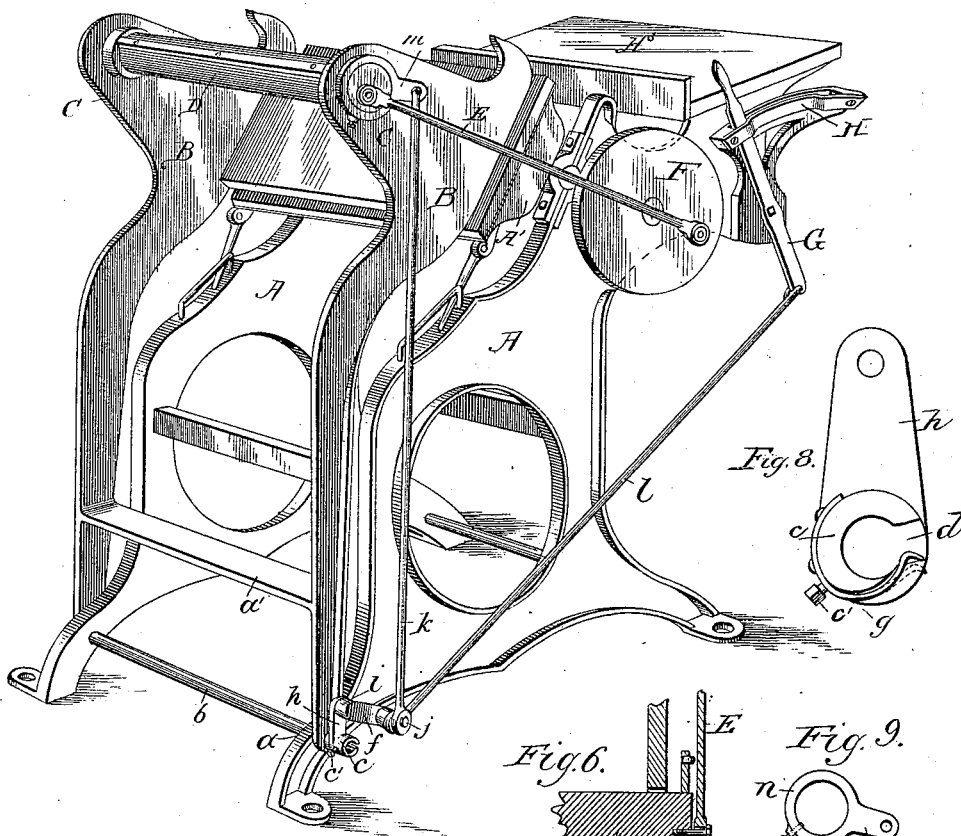


Fig. 8.

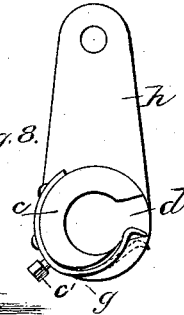


Fig. 6.

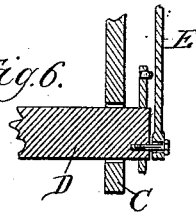


Fig. 9.

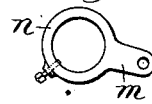
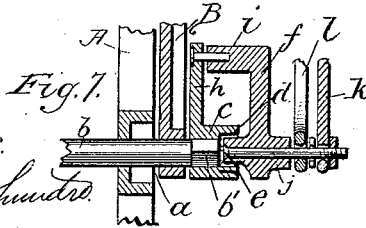


Fig. 7.



Witnesses.

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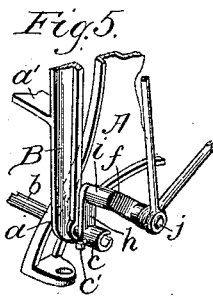
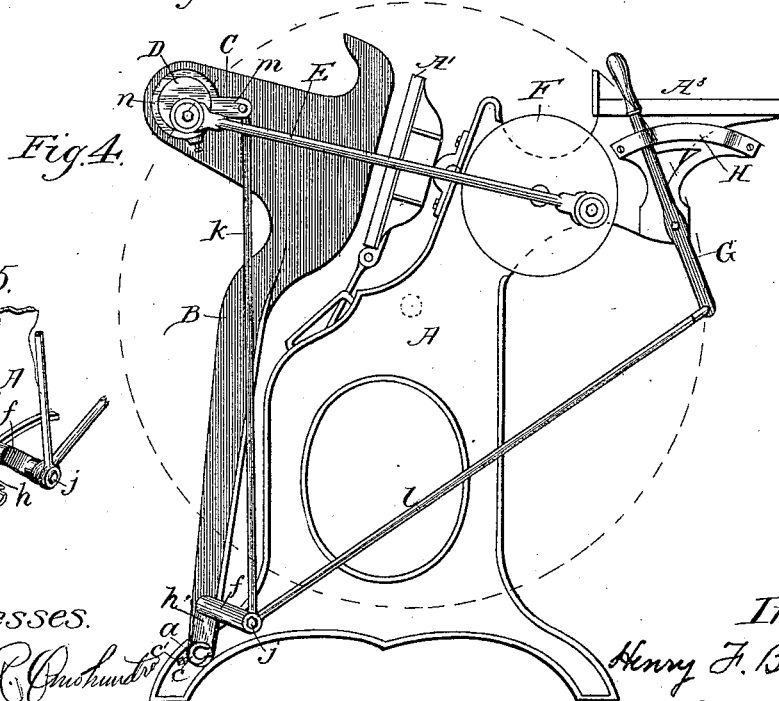
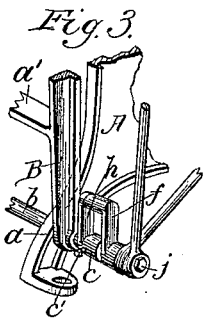
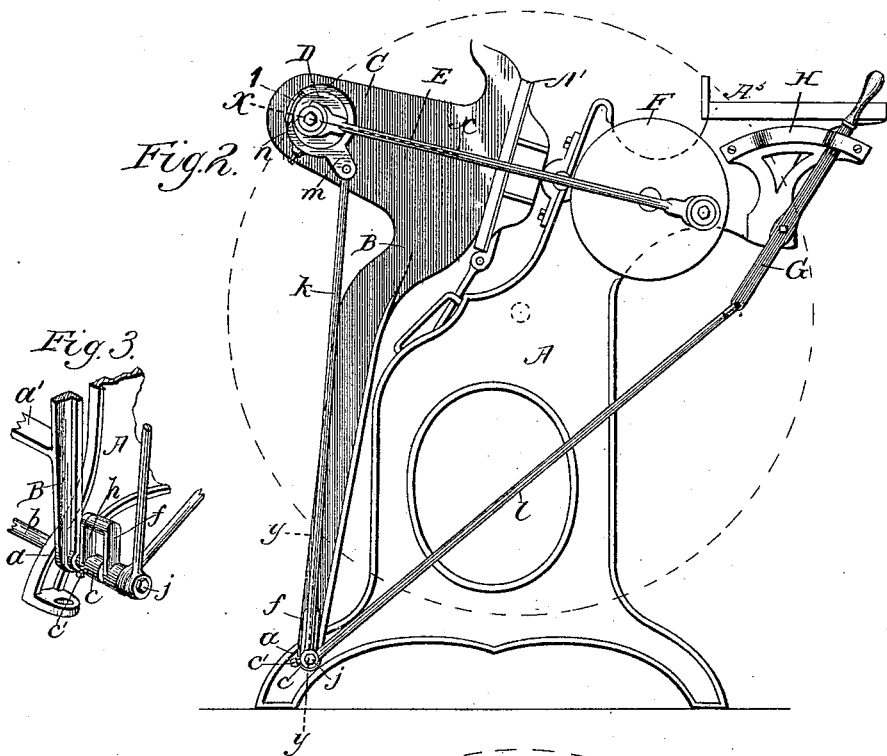
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UNITED STATES PATENT OFFICE.

HENRY F. BECHMAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE SCHNIEDWEND & LEE COMPANY, OF SAME PLACE.

THROW-OFF MECHANISM FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 346,635, dated August 3, 1886.

Application filed February 24, 1885. Serial No. 156,673. (No model.)

To all whom it may concern:

Be it known that I, HENRY F. BECHMAN, a citizen of the United States, residing in Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Throw-Off Mechanisms for Printing-Presses, of which the following is a specification.

This invention relates to improvements in printing-presses, and to that particular class in which means are provided for preventing the type from making an impression while the machine is in continuous operation. Heretofore this object has been attained in various ways, all of which involve expensive and intricate mechanical devices, requiring an expenditure of power to operate the actuating-lever, objectionable to the operator and seriously impeding his work. There is also a further objection—namely, that of the joints and connections wearing or working loose, so that a heavy impression will slightly move the throw-off mechanism at each impression, which movement will in a short time result in producing an imperfect impression and render the press practically useless.

The objects of this invention are to provide a means for preventing the type from making an impression, and which may be easily operated at the will of the pressman at slight expenditure of power and without interruption to the work; to provide a throw-off mechanism for printing-presses which is automatically locked in its position when making an impression, whereby the possibility of imperfect impressions is obviated; to provide in a throw-off mechanism for printing-presses a lock automatic in operation, and which prevents any of the parts working at all loose, and therefore rendering an imperfect impression impossible during the operation of the press; and, finally, to provide certain details of construction, hereinafter more fully described, and illustrated in the accompanying drawings, in which—

Figure 1 represents a perspective view of a throw-off for printing-presses embodying my invention; Fig. 2, a side elevation of an ordinary press frame and back legs or rocking frame with my invention attached, showing the parts in their position when making an

impression and the throw-off mechanism in its normal position; Fig. 3, a perspective view of the lower end of the back leg and lever connection, shown in their position in Fig. 2; Fig. 4, a similar view to Fig. 2, showing the throw-off mechanism in operation and the position of parts when no impression is to be made; Fig. 5, a similar view to Fig. 3, showing the parts in their position in Fig. 4. Fig. 6, a detail section on line *x x*, Fig. 2; Fig. 7, a detail section on line *y y*, Fig. 2. Figs. 8 and 9 are detail views.

A represents the frame of an ordinary printing-press, provided with the usual platen, *A'*, wheel *A*², (shown by dotted lines, Figs. 2 and 4,) and shelf *A*³, which said frame has pivoted thereto at *a* the vibrating frame B, sometimes termed "back leg." This vibrating frame is composed of two legs—one on each side of the frame—which legs are pivoted as before mentioned, and connected near their lower ends by a cross bar or rod, *a'*, and at their upper ends, through the back extensions, C, by a rock-shaft, D, projecting through one or both of the legs. Pivoted eccentrically to the projecting end of this shaft is one end of the connecting-rod E, the other end of which is pivoted to the wheel F, which is revolved in the manner usual in printing-presses of this class, and, through the medium of the connecting-rod, reciprocates the back legs or vibrating frame upon its pivots toward and from the platen, whereby at each reciprocation of the vibrating frame an impression may be made by the type secured in a form attached to the front face of the vibrating frame in the usual manner.

The paper, card, or other material to receive the impression is placed upon the platen in the usual way, and ink is applied to the type in the ordinary manner; but these details it is not considered necessary to illustrate in the accompanying drawings, for they have no material bearing on this invention.

The outer end of the shaft *b*, pivoting the vibrating frame to the main frame and connecting the two legs of the said frame, is made square in cross-section, as shown at *b'* in Fig. 7, in order to form a bearing for the sleeve *c*, which is secured in place by the set-screw *c'*, and prevented from turning on the shaft by

the square portion of the shaft, as aforesaid. The outer end of sleeve *c* projects slightly beyond the end of the shaft, and a small portion of the said sleeve is cut away at the side, as shown at *d*, Figs. 7 and 8, to form a recess for reception of the projection *e* on the inner face of the lower end of the crank-arm *f*. The cut of the sleeve is made on the arc of the circle in which crank-arm *f* moves, and the entrance of said cut is made just large enough to admit the projection *e*; but enlarges toward the center to partially form a lock.

Rigidly secured to the sleeve *c* is a flat spring-catch, *g*, bent on the arc of the circle made in the end of the sleeve, the outer end of which spring is free and turned slightly downward to form the catch, which is of such nature that when the projection *e* enters the recess it will force the spring slightly backward; but as soon as the projection is seated the spring-actuated catch will return to its original and normal position and form a lock, preventing the projection from leaving the recess until the operator so desires.

From the upper face of sleeve *c* projects a short arm, *h*, and laterally projecting from the upper end of crank-arm *f* is an arm, *i*, pivoted to the arm *h*, upon which pivot the crank-arm turns, said arm *i* being of sufficient length to enable the projection on the inner face of lever *f* to enter the recess in the sleeve, and for the lever itself to just clear the end of the sleeve.

The aforesaid projection *e* on the lower end of the crank-arm is cast on it or secured to it by the bolt *j*, which bolt projects beyond the crank-arm and forms a bearing; the two rods *k* and *l* working on the said bolt. The rod *k* extends upwardly in an approximately-vertical line, and is loosely connected at its upper end to the arm *m* of the band *n*, which said band encircles and is bolted or otherwise rigidly secured to the rock-shaft *D*, and when actuated causes the shaft to oscillate. The rod *l* passes upwardly in an oblique line, and is connected with the lower end of throw-lever *G*, pivoted to the frame *A*. The upper end of the throw-lever works between suitable guides, *H*, provided with a spring-catch or other suitable devices for locking the lever at either extremity, and forms, in conjunction with the crank-arm *f* and its connections, a second or double lock, effectually preventing any movement of the rock-shaft *D* while impressions are being made.

When the machine is in operation and on impression, the crank-arm is locked in the recessed sleeve and the arm *m* is at the terminus of its downstroke, as shown in Fig. 2, in which position the distance between the axes of the shaft *D* and wheel *F* is fixed for the time being. With the understanding that the distance between the pivot-bearings of the connecting-rod always remains unchangeable, it will be seen that a forward movement of the hand-lever will swing the crank-arm out of lock with the recessed sleeve in an upward

direction, resulting in lifting the arm to the position shown in Fig. 4. As the arm swings upwardly the shaft is turned in its bearings in the direction indicated by the arrow 1 in Fig. 2, and thereby, owing to the fixed relation of the connecting-rod bearing, shifting the axis of the shaft *D* away from that of the wheel *F*, which shifting may be accomplished at any time during the operation of the machine. Increasing the distance in this manner between the axes of the rock-shaft *D* and wheel *F* fixes the limit of the forward stroke of the back frame at a point in advance of the bed-plate, and hence prevents impressions being made for the time being, and this throw-off may be made and the machine be again put on impression without stopping or even retarding the motion of any of its parts.

When the machine is off impression, the lever *G* serves every purpose of locking it in that condition, for, except the effects of gravity of the parts, there is absolutely no strain tending to throw the machine on impression.

As shown in Fig. 2, when the press is on impression, the center of shaft *D*, the pivots of connecting-rod *E*, and the center of wheel *F* are in a line just at the moment the impression is made, the centers of the shaft and wheel being between the pivots of the rod *E*. This disposition of the centers at the time the press is at its greatest strain forms a dead-center or lock, and reduces the strain on the rod *k* and its connections to a minimum, and makes the liability of an imperfect impression in consequence of movement of the throw-off devices absolutely impossible. When the press is not making impressions, as shown in Fig. 4, the pivot of the rod and the wheel-center are in a line at the time of revolution of the wheel corresponding to Fig. 2; but the center of shaft *D* is out of line. By a partial revolution of the said shaft, the pivot of the connecting-rod eccentrically secured to it being fixed relative to the distance between it and the wheel *F*, the pivot of the rod on the end of the shaft travels downward, and acts in its turn as a center upon which the shaft oscillates, and causes the vibrating frame to move backward a distance to correspond with the degree of oscillation of the shaft, and a sufficient distance to prevent the impression being made when the rocking frame is at its nearest point to the main frame.

It will be observed that when the press is on impression, the rod *k* being pivoted on a center with the pivots of the vibrating frame, although it travel with the frame in its to-and-fro vibrations, the parts are relatively stationary to each other, and the rod causes no movement whatever of the rock-shaft *D* during these vibrations. The center of lever *f* and the pivot of the vibrating frame *B* and sleeve *c*, when the press is on impression, are in the line of strain, and hence form a dead-center or lock to effectually prevent oscillation of the rock-shaft *D*. If it is desired, the sleeve *c* could be turned slightly to one

side of the center, and thus when the projection was seated in the recess formed in the sleeve it would pass just beyond the center, and form a lock which could not be shaken or strained. It will thus be seen that when the press is on impression my throw-off is locked against strain, both at the pivotal points and by the operating-lever.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

I claim—

1. The rocking frame, the pivoting-shaft thereof, the main frame, the crank-wheel thereon, and an eccentric connection between said wheel and rocking frame, in combination with a rod and crank-arm connection between the said eccentric connection and the pivoting-shaft of said rocking frame, substantially as described.

2. The rocking frame, the pivoting-shaft thereof, and the rock-shaft journaled in said frame, the main frame, the crank-wheel thereon, and the connecting-rod thereof eccentrically pivoted to said rock-shaft, in combination with a rod and crank-arm connection between the rock-shaft and the pivoting-shaft of the rocking frame, substantially as described.

3. The rocking frame, the pivoting-shaft thereof, the main frame, the crank-wheel thereon, and an eccentric connection between said wheel and rocking frame, in combination with a rod and crank-arm connection between the eccentric connection and the said rocking-frame shaft, and a locking device between said rod and the crank-arm *h*, substantially as described.

4. The rocking frame, the pivotal shaft thereof, and the notched crank-arm on said shaft, in combination with the crank-wheel, an eccentric connection between said wheel and rocking frame, a rock-shaft, and a crank-arm

and rod connection between said rock-shaft and the crank-arm on the pivotal shaft of the rocking frame, substantially as described.

5. In a printing-press, the rocking frame, the pivoting-shaft at the lower end thereof, and a rock-shaft at its upper end, in combination with the main frame, the crank-wheel thereof, and connecting-rod between the rock-shaft and crank-wheel, eccentrically pivoted to the rock-shaft, an arm, *m*, and a crank-arm and rod connection between said arm and pivoting-shaft, substantially as described.

6. In a printing-press, the rocking frame B, rock-shaft D, wheel F, connecting-rod E, band *n*, arm *m*, and rod *k*, in combination with crank-arm *f*, pivotal arm *h*, rod *l*, lever G, and frame A, substantially as described.

7. In a printing-press, the rocking frame B, rock-shaft D, band *n*, arm *m*, and rod *k*, in combination with crank-arm *f*, pivotal arm *h*, sleeve *c*, projection *d*, rod *l*, lever G, and frame A, substantially as and for the purpose set forth.

8. In a printing-press, the frame A, the crank-wheel thereof, the rocking frame, the rock-shaft thereof, and the connecting-rod eccentrically pivoted to the rock-shaft, in combination with sleeve *c* and arm *h* thereof, the pivot-bolt *j*, the crank-arm *f*, pivoted thereon and to the arm *h*, the rod *l*, lever G, and rod *k*, pivoted upon said bolt, substantially as described.

9. In a printing-press, the combination of the frame A, rocking frame B, rock-shaft D, band *n*, arm *m*, connecting-rod E, wheel F, rod *k*, lever *f*, pivotal arm *h*, sleeve *c*, projection *d*, rod *l*, and lever G, substantially as described.

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Witnesses:

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